IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	**10/734,014**	Confirmation No.: 2369
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Filed:	**DECEMBER 11, 2003**	
TC/A.U.	**1795**	
Examiner:	**Matthew J. Merkling**	
Title:	**EXHAUST TREATMENT DEVICE AND METHODS OF MAKING THE SAME**	
Docket No.:	**034166.053**	
Customer No.:	**25461**	

MAIL STOP AMENDMENT
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Sir:

REQUEST FOR RECONSIDERATION

Reconsideration is respectfully requested of the Official Action of October 10, 2008, relating to the above-identified application.

The claims in the case are 1 to 6, 8, 9 and 12 to 26. Claims 14 to 24 stand withdrawn from further consideration as being directed to a non-elected invention.

In one aspect, the present invention relates to an exhaust treatment device which is formed of a substrate having a 1-catalyst layer deposited on the substrate. The catalyst layer itself comprises a first catalytic metal and a second catalytic metal. A feature of the present invention is that 70% or more of the first catalytic metal and the second catalytic metal are present in the exhaust treatment device of the invention in a non-alloyed state and wherein the weight percent is based on the combined weight of the first and second catalytic metal.

A further feature of the invention is that the first catalytic metal and the second catalytic metal are different and individually selected from the group consisting of platinum, palladium, rhodium, iridium, rhodium, ruthenium and osmium.

The catalyst layer also comprises an aluminum oxide and an oxygen storage component (OSC) wherein the aluminum oxide and the OSC have average pore diameters of about 150 Angstrom to about 1,000 Angstrom and where the OSC component is represented by the formula:

$Ce_aZr_bLa_cY_dPr_eO_x$ as defined in Claim 1.

As a result of this single, 1-layer catalyst design, the advantage of a more simple catalyst design compared to the 2-layer catalyst is achieved; see [0032].

Unlike convention 2-layer catalyst designs, the catalyst of the invention is a single layer catalyst capable of preventing Pd-Rh interaction; i.e., preventing alloy formation. As such, the 1-layer catalyst is capable of maintaining its palladium function and its rhodium function; see [0033].

The rejection of Claims 1 to 6, 8 and 9 under 35 U.S.C. § 103(a) as unpatentable in view of the U.S. patent of *Sung*, U.S. 5,981,423, newly cited, taken with the *Fujitani* patent, U.S. 4,239,656 of record, is traversed and reconsideration is respectfully requested.

The Official Action describes the *Sung* patent as showing an exhaust treatment device containing a substrate and a one layer catalyst deposited on the substrate where the catalyst layer is formed of a first catalytic metal such as palladium and a second catalytic layer such as rhodium (Rh) wherein greater than or equal to about 70% of the first and second catalyst metals are non-alloyed under alloying conditions.

The Official Action also sets forth that *Sung* fails to explicitly disclose that the aluminum oxide and the OSC have average pore diameters of about 150 Angstroms to about 1,000 Angstroms. A careful review of the *Sung* patent shows that it discloses a single layer

which contains Pd and Rh on separate first and second supports. *Sung* admits that it is crucial to separate the palladium and rhodium because if they are together, alloy formation will occur with detrimental effects; see col. 9, lines 50 to 55 and col. 13, lines 6 to 12.

The improvement alleged by *Sung* relating to overcoming this problem is explained by *Sung* in col. 7, lines 1 to 38 and col. 8, lines 25 to 67. This is said to be accomplished by separating the palladium and rhodium metals. This is done by generating a clear bi-modal distribution of support particle sizes for the palladium and rhodium metals.

Palladium is selectively put on the smaller particle sized support and, thus, will segregate to the bottom of the layer during coating and the rhodium is on the larger particle sized support and will segregate to the top of the layer. Thus, following the teachings of *Sung*, there is obtained a type of separation as in a 2-layer catalyst wherein palladium is in the first or bottom layer and rhodium is in the top or second layer. See, for example, col. 7, lines 1 to 18.

This type of product requires separate milling of the palladium and the rhodium slurries. In one case, the palladium is prepared and fixed to one slurry, milled to a smaller particle size of 90% being less than 10 microns (see example 1, column 20, lines 34 to 40) and then adding the rhodium slurry and milling further to reduce the rhodium support to 90% being less than 25 microns. Alternatively, one can mill each slurry separately and finally combine them as the final coating slurry. Examples 3 and 4 of the *Sung* patent show that bottom slurries are milled separately and finally combined to give a single coating slurry.

Sung admits that separation of the Pd and Rh using different supports and particle sizes is critical. In the present application no effort is made to separate the PGM by particle size differences and, in fact, applicants specifically avoid having different particle sizes for the Pd and Rh supports.

i) The *Sung* coating: This coating uses what is called a metered charge process. A fixed charge of slurry is delivered to a pan shaped holder in the coater and then the coater delivers all the slurry into the part, such as a honeycomb corner. The slurry delivered partially fills the part, usually half. The part is then rotated and the other half/section of the raw part is coated. The critical point is that all of the slurry delivered for coating is applied to the part and nothing is returned to the main feed tank.

ii) Applicants' process: In this process the part is lowered into a feed tray with excess slurry. Part of this slurry is drawn into the part using a vacuum and the part is partially filled but with excess slurry. The part is rotated and a vacuum is applied to the other end and excess slurry is pulled out and re-cycled for further use. The wash coat loading is defined by the fill gram (amount pulled into the parts), specific gravity, viscosity etc and the level of vacuum clearing. One clear effect of this coating method is that during clearing the slug of slurry is being pulled through a dry section of the monolith. As the slurry exits the part, water is being pulled out of slurry as well as **fine particles** and of coarse water and solubles. Thus, for the slurry that is exiting the part a much higher solid content and a significant depletion of fines in the slurry is obtained. The amount of slurry that is pulled out depends on many parameters such as fill gram and porosity of the substrates. Typical substrates have up to 30% porosity. As a result of this, applicants intentionally design their slurries so that the particle sizes and distributions that support the Pd and Rh are as identical as possible. Otherwise, one would have selective separation of Pd and Rh during coating and putting the Pd on fines as in the *Sung* patent will completely foul up the coating process. What will happen is that in the beginning of coating applicants selectively put Pd on the parts and as one progresses through the process Pd depletes in the tank and then Rh will selectively be put on the parts.

Sung patent never showed performance from a true reference catalyst where the particle sizes were the same for the supports used for Pd and Rh so alloy formation could occur as they claimed it would. *Sung* did not measure by XRD if alloy formation occurred. *Sung* also did not do full separation of the Pd and Rh supports in a two layer design with the same total wash coat load as applicants did in Figures 2 - 4 so as to prove that the performance is the same for the single layer design of their invention. Thus, there is no data in the *Sung* patent whatsoever to show that *Sung* got reference performance values for a Pd/Rh segregated design or for a design where Pd and Rh interact and form alloys. Applicants have shown that applicants get performance identical for a 2-layer design (Figures 2 – 4) with the same wash coat loading and overall wash coat composition. *Sung* also did not show SEM or other data indicating separation of the Pd and Rh wash coat components by their preparation method.

The Official Action alleges that it would have been obvious to a person having ordinary skill in the art at the time of the invention to replace the supports of *Sung* with the supports found in the *Fujitani* patent. However, it should be noted that *Sung* requires that each of the precious metal components have its own support. Consequently, a person skilled in the art would not necessarily conclude that both precious metals of *Sung* should be placed on the single support of *Fugitani*. Two different supports for the two different precious metal components shown in the *Sung* patent are described, beginning in col. 6, at line 40. *Sung* specifically teaches that the particle size must be different for the two precious metals and, therefore, a person skilled in the art would not be lead to replace the two different supports of *Sung* with the particular support of *Fujitani*, which is a single support. The *Fujitani* support does not have two different particle

sizes. Therefore, a person skilled in the art with the knowledge of these two references would not be lead to the conclusion that the two different supports of *Sung* should be replaced with the single support of *Fujitani*. Thus, the two references are not compatible and have divergent teachings which would lead a person skilled in the art not to follow the proposal set forth in the Official Action. Consequently, applicants respectfully submit that the combination of references does not create *prima facie* obviousness of the claimed invention.

With respect to Claims 3-6 and 9, the comments made apply here as well. The references fail to create *prima facie* obviousness of the claimed invention.

The rejection of Claims 12 and 26 under 35 U.S.C. § 103(a) as unpatentable over *Sung, et al.*, taken with *Fujitani* and further in view of *Anatoly, et al.*, US 6,387,338 (of record), is traversed and reconsideration is respectfully requested.

Claim 12 is dependent on Claim 1 and differs therefrom by specifying the chemical composition of the oxygen storage components. Claim 26 is dependent on Claim 1 and specifies more particular values of the subscripts for the oxygen storage material of formula 1. It has already been explained that the combination of *Sung* and *Fujitani* does not create *prima facie* obviousness for the claimed subject matter of Claim 1 and, therefore, the same arguments apply with respect to Claims 12 and 26.

The addition of *Anatoly* does not fulfill the shortcomings of the combination of references and, consequently, applicants respectfully submit that a person skilled in the art would not be lead to the claimed invention from the thoughtful consideration of the teachings of the references.

The rejection of Claim 13 under 35 U.S.C. § 103(a) in view of Sung taken with *Fujitani* and further in view of *Suzuki*, US 6,335,305 is traversed and reconsideration is respectfully

requested. Claim 13 depends on Claim 1 and differs therefrom by specifying that the oxygen storage component has a stable cubic structure.

The shortcomings of the *Sung* and *Fugitani* references have already been discussed above and those comments apply here as well.

Applicants respectfully submit that even if the teachings of *Suzuki* were combined with those of the principal references, the person skilled in the art would be lead away from the present invention and would be lead away from a combination because the two references are not compatible and are inconsistent with each other. Consequently, it is respectfully submitted that the rejection of Claim 13 is not well-founded and should be withdrawn.

Claim 25 is directed to an exhaust treatment device comprising a substrate and a catalytic layer and differs from Claim 1 by specifying that it also includes a retention material disposed around the substrate to form a subassembly and a housing disposed around a subassembly.

The *Foster* patent is relied on to show a retention material and a housing. However, the combination of references does not establish *prima facie* obviousness of the claimed invention because the principal references of *Sung* and *Fujitani* are actually incompatible with each other for the reasons explained above. The rejection of Claim 25 should therefore be withdrawn.

Consequently, a person skilled in the art would not be lead to the present invention by a consideration of the references relied on in the Official Action.

The rejection is deemed to be improper and therefore, withdrawal thereof is respectfully requested.

Favorable action at the Examiner's earliest convenience is respectfully requested.

Respectfully submitted,

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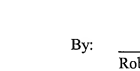
By: 
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